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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,738	10/15/2003	Kyung-Soo Kim	SAM-0465	6148

7590

09/14/2005

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EXAMINER
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CHEN, KIN-CHAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 09/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/685,738

Applicant(s)

KIM ET AL.

Examiner

Kin-Chan Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-19 is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pradeep et al. (US 6,821,904; hereinafter "Pradeep").

In a method for forming multiple thickness gate dielectric layers, Pradeep (col. 4, lines 8-50) teaches that a dielectric may be formed on a semiconductor substrate. A portion of dielectric layer may be removed so as to expose a portion of the dielectric layer to form a gate dielectric layer including a thick portion of the dielectric layer and a thin portion formed of the exposed dielectric layer. Pradeep teaches that the dielectric layer may be oxide layer, nitride layer or other material suitable for use as a gate dielectric (**specifically, col. 4, lines 17-20**). Hence, it would have been obvious to one with ordinary skill in the art to use oxide layer, nitride layer, and other material suitable for use as a gate dielectric or **combination thereof because they have been used for the same purpose as gate dielectric**.

" It is prima facie obvious to use two compositions (two methods) each of which is taught by the prior art to be useful for the same purpose. " In re Kerkhoven 205 USPQ

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1069 (CCPA 1980). In re Susi 169 USPQ 423, 426 (CCPA 1971). See also Ex parte Quadranti 25 USPQ 2d 1071 (BPAI 1992).

As such, a portion of dielectric layer, which is removed, may be second layer (oxide layer), and the first layer (e.g., nitride layer) is therefore exposed as instantly claimed, and the etch selectivity between two different materials would have been expected. It would have been further obvious to one with ordinary skill in the art that the second dielectric layer is higher than that of the first dielectric layer since the first dielectric layer is exposed after the second dielectric layer is etched as aforementioned. Pradeep also teaches nitridizing the surface of the gate dielectric layer (col. 5, lines 25-60).

Dependent claim 9 differs from Pradeep by repeating the process by using three dielectric layers. It would have been obvious to one with ordinary skill in the art to use the combination of three dielectric layers because they have been used for the same purpose as gate dielectric, and repeat the foregoing process steps.

The above-cited claims differ from the prior art by specifying well-known features (such as rapid thermal oxidation in claim 4; using hafnium oxide or aluminum oxide in claim 5) to the art of semiconductor device fabrication. A person having ordinary skill in the art would have found it obvious to modify Pradeep by adding any of same well-known features to same in order to meet specific product design and requirement with a reasonable expectation of success. The examiner takes official notice of facts that applicant did not traverse the aforementioned conventionality (e.g.,

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well-known features, common knowledge), which have been stated in the previous office action (May 10, 2005).

***Response to Arguments***

3. Applicant's arguments filed August 12, 2005 have been fully considered but they are not persuasive.

Applicant has argued that Pradeep does not teach or suggest that the single dielectric could be formed as a combination of layers of different materials. It is not persuasive. As has been stated in the office action, Pradeep teaches that the dielectric layer may be oxide layer, nitride layer or other material suitable for use as a gate dielectric (**specifically, col. 4, lines 17-20**). Hence, it would have been obvious to one with ordinary skill in the art to use oxide layer, nitride layer, and other material suitable for use as a gate dielectric or **combination thereof because they have been used for the same purpose as gate dielectric**. See also cited case law above.

***Allowable Subject Matter***

4. Claims 10-19 are allowed.

***Conclusion***

**5. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

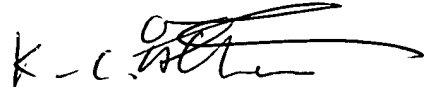
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

**6.** Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (571) 272-1461. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For

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more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*September 8, 2005*

  
Kin-Chan Chen  
Primary Examiner  
Art Unit 1765

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